List of Design and Operational Issues for Buckman Diversion Project

PREPARED FOR: Mike Sanderson
Vice President
Las Campanas Engineering

COPIES: Mark Ryan, PE, CDM; Rick Carpenter, PE, City of Santa Fe; Norm Gaume, PE, Consultant for City of Santa Fe

PREPARED BY: Walter Hines, PE and Mike Brewer, PE
CH2M HILL, Albuquerque

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As discussed at our meeting of February 28, 2005 in Santa Fe, summarized below is our preliminary list of items and issues that need to be addressed in preliminary design of the "shared-facilities" portion of the Buckman Diversion Project. We have assumed that the Las Campanas only facilities will begin at the Pump Station 2A rather than 1A. We welcome your additions and comments to the list and look forward to meeting again on March 11 at 2:00 p.m. at CDM offices in Albuquerque.

River Intake

- Required capacity and range of water level conditions likely to be experienced -- confirmation of extreme high and low flow conditions at intake site
- Review and confirmation of "slant-screen" intake as best diversion alternative
- Location on river bank and extent of "stick out" into river channel – confirm channel geometry and bathymetry; run HEC model to confirm optimal location
- Overall screen panel size, screen opening size, entrance velocity – confirm design criteria for local fishery population with FWS and NM Department of G&F
- Size and dimensions of individual screen embayments; consider sediment management in designing embayments; special shapes needed to better move sediment efficiently to pumps
- Inlet piping to intake pump station – pipe material, diameter, valving
- Sand return flow pipe and nozzle placement on intake structure
- Screen cleaning system (e.g., compressed air, water jetting, etc.)
- Configuration of apron and approach to intake facility – i.e., upstream and downstream wing walls, access way to facility, apron in front of screens, etc.
- Flood control improvements needed to protect intake from washout and damage – both river- and arroyo-related improvements

Intake Pump Station and Associated Facilities

- Required capacity and TDH of pumping system to convey water to sediment removal facility (SRF) near Well 2 – system curve for individual pumps and combined pumping by 2 or more units, design of impellers to resist wear due to sand pumping
- Capacity of individual pumps for each embayment/screen
- Location of pump station relative to 100-year flood level and type of housing– i.e., above ground, ground level, below ground
- Type of pumping system – i.e., submersible, line shaft turbine, etc.
- Location and type of housing for electrical system, controls, intake compressors, etc.
- Flood control improvements needed to protect pump station and other systems

Conveyance Piping to SRF

- Size and pipe material for conveyance pipe to SRF – i.e., one or two pipes?; consider both hydraulic optimization and sediment management in selection
- Pipeline route and alignment to SRF – along road, arroyo crossings, etc.
- Need for encasement and or deep undercrossings of arroyos – other flood protection needs
- Blow off valves, air and vacuum relief valves
- One or two trenches if two pipes are used?; consider sediment return line from SRF to intake in planning alignment; also consider possible return flow credit line from Santa Fe WWTP in planning

Sediment Removal Facility

- Confirm adequacy of overall site plan for inclusion of all facilities, including high-head pump station 1A, mechanical separators, sediment ponds, equipment access, storage, and site buildings
- Confirm design criteria for size of particle to be removed– i.e., > 0.10 mm; > 0.25 mm, etc
- Confirm sizing of sediment storage ponds for both SRF2 and SRF3 alternatives
- Evaluate mechanical separator removal options -- develop removal criteria, performance requirements
- Develop preliminary site facility layout, yard piping, and electrical systems; housing for mechanical separators; sediment pond size, dimensions, drainage system, etc.
- Consider and evaluate control system alternatives for linking intake pumping station, separators, and Pump Sta. 1A
- Preliminary design of sand return system to river (SRF 1) based on carry water volume, sediment volume, and sediment size
- Preliminary design of sand trucking system (SRF 2) – truck and equipment access to ponds; volumes of sediment

High-Lift Pump Pumping System at Station 1A (at SRF site near Well 2)

- Required capacity and TDH of system to convey water to Station 2A; define system cure for range of high and low flows likely to occur

- Preliminarily size pumps and associated plumbing, valving, and electrical facilities
- Evaluate need for surge control – tank or control valve, etc
- Consider sediment characteristics in pump evaluation – e.g., special impeller material to resist abrasion, etc
- Evaluate wet well requirements (size, shape, etc) and need to use wet well level as main controller of intake pumps
- Consider sediment management in wet well design
- Develop overall pump station schematic, including preliminary architectural concepts
- Examine telemetry alternatives (radio, satellite tie in, phone, etc) for this and other facilities

Conveyance Pipeline to Station 2A

- Confirm alignment and crossings -- arroyos, other utilities including gas, fiber optic, telephone, etc
- Pipe (s) size and material – consider two pipes?; consider both hydraulic optimization and sediment transport; valving
- Sediment management – scheme for surging and cleaning, blow offs, intermittent sediment storage at blow offs

Pump Sta. 2A

- Required capacity and TDH of system to convey water to Station 2A; define system curve for range of high and low flows likely to occur
- Site plan, pump station housing and integration with existing facilities; architectural concepts; Las Campanas pumps separate from City/County pumps
- Size and location of delivery tank from 1A conveyance line; suction side plumbing to 2A pumps; consider need for tank agitation and blow off for sediment management
- Control and telemetry scheme
- Electrical system

Buckman Road Improvements

- Confirm Lopez-Tierra preliminary design plans for Buckman Road; possible effect of pipeline crossing on plans; drainage issues
- Evaluate safety/traffic issues related to sand trucking alternative (SRF2) and existing/proposed road alignment

Permitting

- 404 permit for near-river facilities and pipeline crossings of arroyos along alignment
- BLM and Forest Service Plan of Development permitting/submittals
- NPDES issues relative to sand return alternative (SRF1)
- County and State building permit requirements
- FEMA requirements and submittals